SB761
U7N6
no. 74-21

INSECT DISEASE REPORT
USDA FOREST SERVICE/NORTHERN REGION

Report No. 74-21

5200
August 1974

ASH BORER DAMAGE IN GREEN ASH WINDBREAKS SURROUNDING THE BOWMAN-HALEY RESERVOIR IN NORTH DAKOTA, SPRING 1974

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EXPERIMENT STATION

by

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ABSTRACT

An active infestation of ash borer, *Podosesia syringae* (Harris) was detected in green ash, *Fraxinus pennsylvanica* Marsh, surrounding the Bowman-Haley Reservoir in 1973. A survey in 1974 showed that 40.4 percent of 690 trees examined contained active ash borer attacks. Forty-three out of 140 windbreaks were sampled and each one was infested. There was an average of 1.8 attacks per infested tree.

The survey indicated that the infestation will continue in 1974. Plans are being made to test several chemicals on the ash borers at the Bowman-Haley damsite.

INTRODUCTION

The ash borer, *Podosesia syringae* (Harris), is a serious threat to the management of windbreak plantings containing green ash in North Dakota. A Statewide survey in 1972 showed the ash borer was present in 51 percent of the shelterbelts containing green ash (Tunnock and Tagestad, 1973).

In September 1973 Arden Tagestad found that 68 percent of the green ash trees in windbreaks around the Bowman-Haley Reservoir contained current attacks of ash borer. This area is administered by the Corps of Engineers. These results were reported to both State and Private Forestry in Missoula and to J. E. Shanks, Corps of Engineers, Omaha, Nebraska. A more intensive survey for damage was subsequently requested by the Corps. This was done on April 30 and May 1, 1974.

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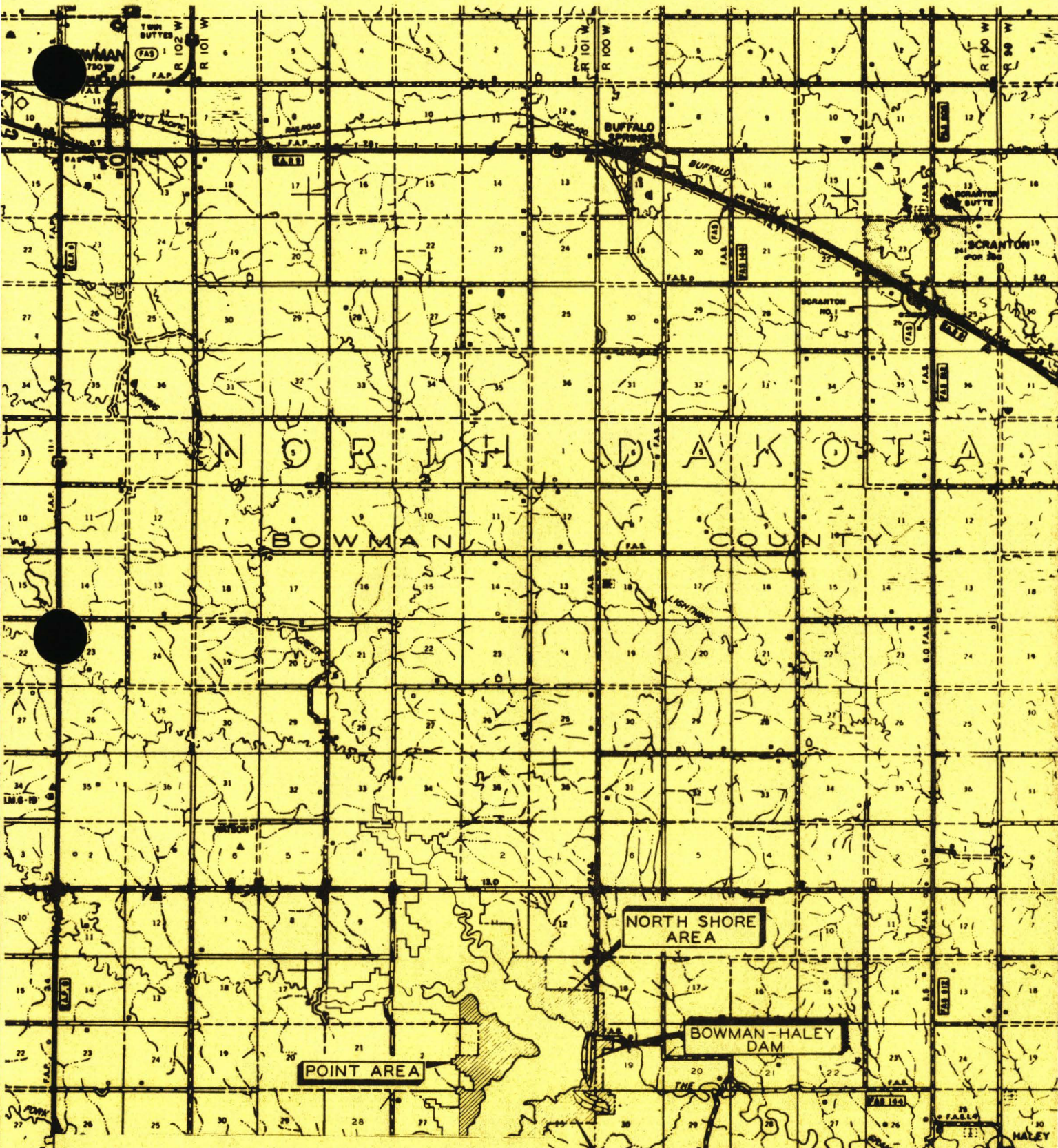

Figure 1.--Location of windbreaks containing green ash around Bowman-Haley Reservoir in southwest North Dakota

METHODS

Green ash in 140 windbreaks are planted in three general areas around the reservoir--Point Area, North Shore Area, and South Shore Area (Fig. 1). The windbreaks vary in length from 400 feet to 1,000 feet and consist of one row of caragana, two rows of Siberian elm, and one row of green ash. Forty-three of the longest windbreaks were sampled during the 2-day survey.

In each windbreak sampled, every third tree was examined for active ash borer attacks, and the number of attacks per tree was recorded. Old attacks and damage (Fig. 2) were not recorded. Trees varied in diameter from 0.5 to 3.5 inches.

Figure 2.--Wind breakage caused by ash borer larvae tunneling in stems of green ash.

RESULTS

In the 43 windbreaks sampled, 40.4 percent of the 690 trees examined contained active ash borer attacks. Ash borers were present in all the 43 windbreaks. Attacks per tree ranged from one to nine and averaged 1.8 (Table 1).

Table 1.--Active attacks of ash borers in windbreaks around the Bowman-Haley Reservoir in North Dakota during late April 1974.

Area	Belt number	No. trees examined	No. trees attacked	Percentage of trees attacked	Total attacks	Average attacks per infested tree
Point	1	16	14	87.5	30	2.1
	2	15	5	33.3	10	2.0
	3	13	7	53.8	9	1.3
	4	15	7	46.7	11	1.6
	5	28	3	10.7	4	1.3
	6	16	2	12.5	4	2.0
	7	17	11	64.7	22	2.0
	8	40	10	25.0	13	1.3
	9	18	9	50.0	14	1.5
	10	17	12	70.6	24	2.0
	11	6	4	66.7	8	2.0
	12	7	5	71.4	9	1.8
	13	33	4	12.1	8	2.0
	14	11	7	63.6	15	2.1
	Subtotal	252	100		181	
	Average			39.7		1.8
South Shore	15	17	4	23.5	19	4.7
	16	12	1	8.3	1	1.0
	17	14	10	71.4	17	1.7
	18	13	5	38.5	7	1.4
	19	21	14	66.7	45	3.2
	20	22	13	59.1	17	1.3
	21	13	10	76.9	23	2.3
	22	13	12	92.3	27	2.2
	23	18	12	66.7	16	1.3
	24	21	19	90.5	43	2.3
	25	10	9	90.0	23	2.5
	Subtotal	174	109		238	
	Average			62.6		2.2

Table 1 (continued)

Area	Belt number	No. trees examined	No. trees attacked	Percentage of trees attacked	Total attacks	Average attacks per infested tree
North Shore	26	7	2	28.6	3	1.5
	27	7	4	57.1	5	1.2
	28	19	1	5.3	1	1.0
	29	19	2	10.5	2	1.0
	30	20	8	40.0	9	1.1
	31	12	5	41.7	5	1.0
	32	18	7	38.9	7	1.0
	33	10	4	40.0	4	1.0
	34	13	2	15.4	2	1.0
	35	23	7	30.4	8	1.1
	36	24	3	12.5	6	2.0
	37	10	1	10.0	1	1.0
	38	9	4	44.4	4	1.0
	39	8	2	25.0	2	1.0
	40	31	2	6.4	2	1.0
	41	10	6	60.0	8	1.3
	42	10	1	10.0	3	3.0
	43	14	9	64.3	14	1.5
	Subtotal	264	70		86	
	Average			26.5		1.2
	Grand total	690	279		505	
	Average			40.4		1.8

The south shore area had the highest percentage (62.6) of trees infested. Belt No. 19 had 45 attacks in 14 trees and the average number of attacks per tree for this area was 2.2 (Table 1).

A "T"-test at the 90 percent confidence level indicated there were significantly more trees infested in the Point area than in the North Shore area. The percentage of trees infested were 39.7 and 26.5 respectively. Average attacks per tree were 1.8 for the Point area and 1.2 for the North Shore area (Table 1).

Most of the ash borers were in the pupal stage (Fig. 3) and several pupal chambers contained the parasite *Macrocentrus marginator* (Nees). Some woodpecker predation was obvious in most of the belts.

DISCUSSION

The results of this survey indicate there will be numerous ash borer adults this spring to keep the infestation at a high level during 1974. Entomologists at the Shelterbelt Laboratory in Bottineau have asked permission to use some belts in the area to test chemicals for the control of the ash borer and to further study the biology of this moth.

Although old attacks were not recorded in this survey, a high percentage of the trees harbored old borer injury and some trees were broken at points of multiple attacks.

The number of new attacks (containing pupae) may have been underestimated because some of the attacks which were considered "old" had pupae inside them. This was observed after a selection of "old" attacked material produced adult moths in the laboratory.

Figure 3.--Ash borer pupa within tunnel in green ash.

REFERENCES

Tunnock, S. and A. Tagestad, 1973. Incidence of wood borer activity in green ash windbreak plantings in North Dakota. USDA, Forest Service, State and Private Forestry, Missoula, Montana, Report 73-5.

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